REMARKS

Applicants wish to thank the Examiner for the attention accorded to the instant application, and respectfully request reconsideration of the application in view of the following remarks.

Formal Matters

Claims 1, 2, 4, 5, 7-10, 12, 13, 15, 16 and 18-21 are currently pending in the Application, with claims 1, 4, 8, 12, 15 and 19 being independent claims.

Rejection of Claims Under 35 U.S.C. §103

Claims 1, 2, 4, 5, 7-10, 12, 13, 15, 16 and 18-21 are rejected under 35 U.S.C. § 103(a) as unpatentable over Kumai, U.S. Patent Application Publication No. 2004/0260979 in view of Akers et al., U.S. Patent No. 6,278,967 (hereinafter "Akers") and further in view of Nagao et al., U.S. Patent No. 5,424,947 (hereinafter "Nagao"). These rejections should be withdrawn based on the comments and remarks herein.

As regards independent claims 1 and 12, a text mining apparatus comprises means for generating a sentence structure from an input document, means for generating a similar structure of patterns having a similar meaning of a partial structure of the sentence structure by performing predetermined conversion operation, including at least change in connection of branches in a graph structure, of the partial structure, and means for determining the patterns having the similar meaning as the identical pattern and detecting the patterns. The sentence structure represents a dependency among words (see, Figs. 16A-16C and page 2, lines 10-12 of the specification). The means for generating the similar structure comprises means for performing parallel modification (see, Fig. 18) of sentence structure, means for generating a partial structure (see, Fig. 19) of the sentence structure, means for performing non-directional branching (Figs. 20A-20E) of a directional branch of the sentence structure and/or partial structure, means for replacing a

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synonym (see, Fig. 22) in the sentence structure and/or partial structure by referring to a synonym dictionary, and means for performing non-ordering (see, Fig. 22) of ordering trees of the sentence structure and/or partial structure. The parallel modification is structure modification carrying out the change in connection of the branches so that connecting relationships of the branches in the sentence structure are equal to each other for all of nodes corresponding to the words put in a parallel relationship in the sentence structure (see, Fig. 18 and page 24, lines 12-15 of the specification). The means for generating the similar structure uses the similar structures as an equivalent class of the partial structure of the sentence structure.

Claims 4, 8, 15, and 19 recite a concrete similar-structure generating unit having similar subject matter.

Kumai, Akers, and Nagao do not disclose all of the claimed elements; specifically, they do not disclose subject matter of the parallel modification carrying out the change in connection of the branches in a graph structure, as recited in claims 1, 4, 8, 12, 15, and 19. As such, the current rejection recited in the Official Action does not establish a *prima facie* case of obviousness.

Specifically, Kumai may disclose, in par [0062] and Fig. 5, an example of a screen display of a resemblance sentence retrieving tool for retrieving a sentence which is resembled to a designated sentence. Kumai merely discloses the resemblance sentence retrieving tool that can acquire a list for sentences resembled to one designated sentence. In addition, Kumai also discloses "employing a synonym dictionary", "extracting a featured word contained in a designated sentence", and "providing in a top priority documents having similar featured words to the extracted featured word."

Accordingly, Kumai may disclose components corresponding to "an input document" and "patterns having a similar meaning" as described in claims 1, 4, 8, 12, 15, and 19 but Kumai does

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not disclose other elements recited in these claims. Furthermore, Kumai neither discloses nor teaches a concrete method, e.g., a specific technique, describing how to retrieve (prepare) the "resemblance sentence" from the "designated sentence."

More specifically, as the Examiner acknowledges, Kumai neither discloses nor teaches "a sentence structure" representing a dependency among words, "a similar structure", " a partial structure", and "predetermined conversion operation, including at least change in connection of branches in a graph structure" as described in claims 1, 4, 8, 12, 15, and 19.

In other words, Kumai neither discloses nor teaches "means for generating a sentence structure representing a dependency among words from an input document", "means for generating a similar structure of patterns having a similar meaning of a partial structure of the sentence structure by performing predetermined conversion operation", and "means for determining the patterns having the similar meaning as the identical pattern and detecting the patterns." In addition, Kumai neither discloses nor teaches "the parallel modification" carrying out the change in connection of the branches so that connecting relationships of the branches in the sentence structure are equal to each other for all of nodes corresponding to the words put in a parallel relationship in the sentence structure, as conceded by the Examiner.

Akers discloses, in col. 4, line 41 to col. 5, line 3, an automated natural language translation system which can translate from a source natural language to a target natural language. The translation engine includes a preparer, a parser, a graph maker, an evaluator, a graph scorer, a parse extractor, and a structural converter. The preparer examines the input text and resolves any ambiguities in input sentence boundaries. The preparer then creates and displays the input text in a parse chart to obtain possible syntactic categories for the input text. The graph maker produces a graph of the possible syntactic interpretations of the input text based on the parse chart. The graph includes nodes and subnodes which are associated with possible

interpretations of the input text. The evaluator, which comprises a series of experts, evaluates the graph of the possible interpretations and adds expert weights to nodes and subnodes of the graph. The graph scorer uses the expert weights to score the subnodes, and the graph scorer then associates the N best scores with each node. The parse extractor assigns a parse tree structure to the preferred interpretation as determined by the graph scorer. The structural converter performs a structural conversion operation on the parse tree structure to obtain a translation in the target language.

Akers also discloses, in col. 8, lines 6-7, that "The order in which nodes are visited and scored is a standard depth-first graph-walking algorithm." Furthermore, Akers discloses, in col. 8, line 66 to col. 9, line 46, that "The structural converter may comprise a grammar rule controlled structural converter 36, a lexicon controlled structural converter 38, and a synthesis rule controlled structural converter 40…the preparser 24 first performs a preparsing operation (step 102) on the source text 23. This operation includes the resolution of ambiguities in sentence boundaries in the source text, and results in a parse chart seeded with dictionary entries 25. The parser 26 then parses the chart produced by the preparser (step 104), to obtain a parse chart filled with syntactic possibilities 27. The graph marker 28 produces a graph of possible interpretations 29 (step 106), based on the parse chart resulting from the parsing step. The evaluator 30, which accesses a series of experts 43, evaluates the graph of stored interpretations (step 108), and adds expert weights to the graph 31. The graph scorer 33 scores nodes and associates the N (e.g., 20) best scores with each of them 35. The parse extractor 32 assigns a parse tree structure 39 to this preferred interpretation (step 110). The structural converter 34, which accesses the conversion tables 58, then performs a structural conversion operation (step 112) on the tree to obtain a translation 41 in the target language."

In contradistinction to this, "the predetermined conversion operation" of the present

invention includes at least <u>change in connection of branches</u> in a graph structure to generate the graph structure having the same sense from which a syntactic role may differ while "a structural conversion operation" in Akers carries out a changing of the syntax generation rule in "a graph of generation rule" corresponding to a phrase or a section to carry out the changing of the phrase so that no contradiction arises on a sense and a syntax in the sentence. Therefore, the "structural conversion operation" in Akers is not corresponding to the "predetermined conversion operation" in the present invention at all. Akers also neither discloses nor teaches "parallel modification" carrying out <u>the change in connection of the branches</u> in a graph structure as well as "means for performing non-directional branching" and "means for performing non-ordering of ordering trees" as recited in Claims 1 and 12.

The Examiner acknowledges that Kumai in view of Akers fails to teach "the parallel modification being structure modification carrying out the change in connection of the branches so that connecting relationships of the branches in the sentence structure are equal to each other for all of nodes corresponding to the words put in a parallel relationship in the sentence structure" (Office Action, page 8). Nagao fails to overcome this deficiency.

Nagao describes, in col. 3, lines 23-35, "dependencies among words" which may be identical with "a dependency among words" in the present invention. Accordingly, Nagao may disclose "the sentence structure representing a dependency among words".

The Examiner, referring to Fig. 21 of Nagao, asserts that "Nagao teaches the connection between branches, wherein the relationship is maintained with a synonymous understanding such as "operating system" and "VM/SP" ... "Store" and "keep", and "disk" and "virtual disk". The two structures generated are in parallel with each other and dependency maintained (i.e. subject, verb, etc) even when modification of the elements takes place." (Office Action, page 9)

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However, Fig. 21 of Nagao is an explanatory diagram of the co-occurrence relationship between a path and a sentence (see, col. 4, lines 20-21). This is not an explanatory diagram of "parallel modification" of the present invention. In the present invention, as shown in Fig. 18, "parallel modification" carries out <u>the change in connection of the branches</u> in a graph structure. Accordingly, Nagao neither discloses nor teaches "parallel modification" carrying out <u>the change in connection of the branches</u>, as recited in the claims of the present invention.
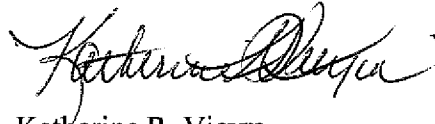
It has been held by the courts that to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. See, *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). See also MPEP § 2143.03. As illustrated above, the hypothetical combination of Kumai and Akers and Nagao, in any combination, does not teach or suggest parallel modification being structure modification carrying out the change in connection of the branches so that connecting relationships of the branches in the sentence structure are equal to each other for all of nodes corresponding to the words put in a parallel relationship in the sentence structure, so that *prima facie* obviousness has not been established. Consequently, independent claims 1, 4, 8, 12, 15 and 19 patentably distinguish over the art of record in the application. Claim 2 is dependent from Claim 1, Claims 5, 7 are dependent from Claim 4, Claims 9-10 are dependent from Claim 8, Claim 13 is depended from Claim 12, Claim 16 and 18 are depended from Claim 15, and Claims 20-21 are dependent from Claim 19. Therefore, dependent Claims 2, 5, 7, 9-10, 13, 16, 18, 20 and 21 patentably distinguish over the art of record in the application for at least the reasons that their base claims patentably distinguish over the art of record in the application.

Hence, withdrawal of this rejection is respectfully requested.

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Conclusion

For the reasons set out above, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested. Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact the undersigned representative at the telephone number below.

Respectfully submitted,

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